AMENDMENTS TO THE CLAIMS

Claims 1 to 12 (Cancelled).

13. (Currently amended) An optical mask comprising:

a plurality of bars arranged in a period array along a first axis of the mask, with spaces between adjacent bars;

wherein each of the bars have substantially regular lateral edges contiguous to said spaces; and

wherein at least one bar includes at least one predetermined irregularity on at least one lateral edge.

14. (Currently amended) The optical mask of claim 13 wherein the one irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge by an amount that is related to a size of the one irregularity.

15. (Original) The optical mask of claim 13 wherein the mask is a phase mask, and the bars have a different thickness in the direction of an optical axis of the mask than the spaces.

16. (Original) The optical mask of claim 13 wherein the mask is an absorption mask, and the bars have a different transmittance than the spaces.

17. (Original) The optical mask of claim 13 wherein the bars are formed from a plurality of pixels.

18. (Original) The optical mask of claim 17 wherein the irregularity is an extra pixel.

19. (Currently amended) The optical mask of claim 18 wherein the irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and away from the bar by an amount that is the size of the extra pixel divided by the number of pixels on the one lateral edge.

20. (Original) The optical mask of claim 17 wherein the irregularity is a missing pixel.

21. (Currently amended) The optical mask of claim ~~13~~ 20 wherein the irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and into the bar by an amount that is related to the size of the missing pixel divided by the number of pixels on the one lateral edge.

22. (Currently amended) The optical device of claim 17 wherein the irregularity is a shifted pixel located on one lateral edge which has been shifted from an opposite lateral edge of the bar from the one lateral edge.

23. (Currently amended) The optical device of claim 22 wherein:

the irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and away from bar by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one lateral edge; and

the irregularity is operative to effectively shift the other lateral edge in a direction that is orthogonal to the lateral edge and into the bar by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other lateral edge.

24. (Currently amended) An optical system for writing a grating into an optical fiber, wherein the optical fiber is located at an output plane of the optical device, the optical system comprising:

a beam generator that provides an input beam; and

a beam separator that receives an input beam and separates the input beam into a plurality of beams;

wherein the plurality of beams interfere with each other at the output plane to form an interference pattern that is used to form the grating; and

wherein the beam separator includes an optical mask comprising:

~~a substrate; and~~

~~a plurality of first optical regions; and~~

~~a plurality of second optical regions that has a characteristic that is different from the plurality of first optical regions;~~

~~wherein the first and second optical regions are interleaved with each other on the substrate;~~

~~wherein each of the first and second optical regions have a substantially polygon shape with a plurality of substantially regular edges; and~~

~~wherein at least one first optical region of the plurality of first optical regions includes at least one predetermined irregularity on at least one edge.~~

a plurality of bars arranged in a period array along a first axis of the mask, with spaces between adjacent bars;

wherein each of the bars have substantially regular lateral edges contiguous to said spaces; and

wherein at least one bar includes at least one predetermined irregularity on at least one lateral edge.

25. (Currently amended) The optical system of claim 24 wherein the one irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge by an amount that is related to a size of the one irregularity.

26. (Cancelled)

27. (Currently amended) The optical system of claim 26 24 wherein the mask is a phase mask and the characteristic is bars have a different thickness in the direction of an optical axis of the beam separator mask than the spaces.

28. (Currently amended) The optical system of claim ~~26~~ 24 wherein the mask is an absorption mask, and the ~~characteristic is~~ bars have a different transmittance than the spaces.

29. (Currently amended) The optical system of claim 24 wherein ~~each of the first and second optical regions~~ the bars are formed from a plurality of pixels ~~arranged in the polygon shape~~.

30. (Original) The optical system of claim 29 wherein the irregularity is an extra pixel.

31. (Currently amended) The optical system of claim 30 wherein the irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and away from the region by an amount that is the size of the extra pixel divided by the number of pixels on the one lateral edge.

32. (Original) The optical system of claim 29 wherein the irregularity is a missing pixel.

33. (Currently amended) The optical system of claim 32 wherein the irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and into the region by an amount that is related to the size of the missing pixel divided by the number of pixels on the one lateral edge.

34. (Currently amended) The optical system of claim 29 wherein the irregularity is a shifted pixel located on one lateral edge which has been shifted from an opposite lateral edge of the polygon shape from the one lateral edge.

35. (Currently amended) The optical system of claim 34 wherein:

the irregularity is operative to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and away from the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one lateral edge; and

the irregularity is operative to effectively shift the other edge in a direction that is orthogonal to the lateral edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other lateral edge.

36. (Original) The optical system of claim 24 wherein the grating is a Bragg grating.

37. (Original) The optical system of claim 24 wherein the input beam is an ultraviolet input beam.

38. (Original) The optical system of claim 24 wherein the beams separator forms the plurality of beams by diffracting the input beam into two first order beams.

39. (Original) The optical system of claim 38 wherein the device further comprises:

a stop which blocks a zero order diffracted beam.

40. (Original) The optical system of claim 24 further comprising:

a focusing lens system that focuses the input beam through the beam separator, thereby focusing the plurality of beams onto the output plane.

41. (Original) The optical system of claim 40 wherein:

the beam separator is larger than a core of the optical fiber in a direction that is orthogonal to the optical axis of the fiber.

42. (Original) The optical system of claim 40 wherein the focusing lens system only focuses light in a direction that is orthogonal from the optical axis of the optical fiber.

43. (Original) The optical system of claim 42 wherein the focusing lens system comprises a cylindrical lens.

44. (Original) The optical system of claim 40 further comprising:

an optical imaging system between the separator and the output plane that images the plurality of beams onto the output plane.

45. (Original) The optical system of claim 44 wherein:

the beam separator is larger than a core of the optical fiber in a direction that is orthogonal to the optical axis of the fiber.

46. (Original) The optical system of claim 44 wherein the imaging system only images light in a direction that is parallel to the optical axis of the optical fiber.

47. (Original) The optical system of claim 44 wherein the optical imaging system comprises at least one cylindrical lens.

48. (Original) The optical device of claim 24 wherein the grating is a chirped grating.

49. (Original) The optical device of claim 48 wherein the grating is a linear chirped grating.

50. (Original) The optical device of claim 48 wherein the grating is a non-linear chirped grating.

51. (Original) The optical device of claim 24 wherein the grating includes a plurality of discrete phase shifts.

52. (Original) The optical device of claim 24 wherein the grating includes a substantially continuous and spatially varying phase shift.

53. (Currently amended) A method for writing a grating into an optical fiber, the method comprising:

providing an input beam; and

separating the input beam into a plurality of beams;

interfering the plurality of beams with each other to form an interference pattern that is used to form the grating; and

wherein the step of separating includes

~~providing a plurality of first optical regions; and~~

~~providing a plurality of second optical regions that has a characteristic that is different from the plurality of first optical regions; wherein the first and second optical regions are interleaved with each other on the substrate; and wherein each of the first and second optical regions have a substantially polygon shape with a plurality of substantially regular edges;~~ and

~~providing at least one predetermined irregularity on at least one edge of at least one first optical region of the plurality of first optical regions~~ providing an optical mask comprising:

a plurality of bars arranged in a period array along a first axis of the mask, with spaces between adjacent bars;

wherein each of the bars have substantially regular lateral edges contiguous to said spaces; and

wherein at least one bar includes at least one predetermined irregularity on at least one lateral edge, which effectively shifts the one lateral edge in a direction that is orthogonal to the lateral edge by an amount that is related to a size of the one irregularity.

54. (Currently amended) The method of claim 53 wherein the step of providing the optical mask ~~plurality of first optical regions~~ comprises:

arranging a plurality of pixels to form each ~~polygon shape~~ bar.

55. (Currently amended) The method of claim 54 wherein the step of providing at least one predetermined irregularity comprises:

adding an extra pixel to the one lateral edge;

wherein the step of adding operates to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and away from the region by an amount that is the size of the shifted pixel divided by the number of pixels on the one lateral edge.

56. (Currently amended) The method of claim 54 wherein the step of providing at least one predetermined irregularity comprises:

removing a pixel from the one lateral edge;

wherein the step of removing operates to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one lateral edge.

57. (Currently amended) The method of claim 54 wherein the step of providing at least one predetermined irregularity comprises:

shifting a pixel to the one lateral edge from an opposite lateral edge of the polygon shape from the one edge

wherein the step of shifting operates to effectively shift the one lateral edge in a direction that is orthogonal to the lateral edge and away from the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the one lateral edge, and to effectively shift the other lateral edge in a direction that is orthogonal to the lateral edge and into the region by an amount that is related to the size of the shifted pixel divided by the number of pixels on the other lateral edge.

58. (Original) The method of claim 57 wherein the grating is a Bragg grating.

59. (Original) The method of claim 53 wherein the input beam is an ultraviolet input beam.

60. (Original) The method of claim 53 wherein the step of separating comprises:

diffracting the input beam into a plurality of first order beams.

61. (Original) The method of claim 60 wherein the step of separating further comprises:

blocking a zero order diffracted beam.

62. (Original) The method of claim 53 further comprising:

focusing the plurality of beams into the optical fiber.

63. (Original) The method of claim 62 further comprising:

focusing the plurality of beams in a direction orthogonal from the optical axis of the optical fiber.

64. (Original) The method of claim 63 further comprising:

imaging the plurality of beams in a direction parallel to an optical axis of the optical fiber.

65. (Original) The method of claim 53 wherein the grating is a chirped grating.

66. (Original) The method of claim 53 wherein the grating is a linear chirped grating.

67. (Original) The method of claim 53 wherein the grating is a non-linear chirped grating.

68. (Original) The method of claim 53 wherein the grating includes a plurality of discrete phase shifts.

69. (Original) The method of claim 53 wherein the grating includes a substantially continuous and spatially varying phase shift.